8-21 PERMANENT SIGNING

8-21.1 Description

This Work consists of furnishing and installing permanent signing, sign lighting, sign removal, sign relocation, and refacing existing signs in accordance with the Plans, these Specifications, and the Standard Plans at the locations shown in the Plans or where designated by the Engineer.

8-21.2 Materials

Signing materials and fabrication of signs shall meet the requirements of Section 9-28. Materials for roadside sign Structures shall meet the requirements of Section 9-06.16. Materials for sign mounting shall conform to Section 9-28.11. Materials for sign bridges, cantilever sign Structures, and bridge mounted sign brackets shall conform to Section 9-28.14(2).

8-21.3 Construction Requirements

8-21.3(1) Location of Signs

Signs are located in the Plans by station numbers. These are tentative locations subject to change by the Engineer. The post lengths specified in the Plans are estimated for Bid purposes only. Final lengths of timber posts will be determined or verified by the Engineer at the request of the Contractor prior to fabrication. Final lengths of steel posts will be determined by the Engineer prior to fabrication.

8-21.3(2) Placement of Signs

All reflectorized signs located less than 30-feet from the edge of the lane should be turned out approximately 3-degrees from the pavement edge of oncoming traffic lanes, and those located 30-feet or more from the edge of the lane should be turned in approximately 3-degrees from the pavement edge of oncoming traffic lanes. All sign posts shall be plumb and signs level. The signs shall be inspected at night by the Engineer and, if specular glare occurs from failure to install at 3-degrees as stipulated, the Contractor shall reinstall the signs at no expense to the Contracting Agency. The post holes shall be of sufficient dimensions to allow placement and thorough compaction of selected backfill material completely around the post. Selected backfill material shall consist of earth or fine sandy gravel free from organic matter with no individual particles exceeding 1½-inches in diameter.

8-21.3(3) Sign Covering

When notified by the Engineer, the Contractor shall cover or uncover certain signs to facilitate and control the operation of the project. The covering shall consist of 4-mils minimum thickness black polyethylene sheeting of sufficient size to entirely cover the sign, unless otherwise approved by the Engineer, and shall extend over the edges of the sign and fastened on the back. The Contractor shall not use any type of adhesive tape on the face of the signs. Other methods of covering may be considered if approved by the Engineer.

8-21.3(4) Sign Removal

Where shown in the Plans or ordered by the Engineer, the existing signs and, if so indicated, the sign Structures shall be removed by the Contractor. Where indicated, the Contractor shall remove concrete pedestals to a minimum of 2-feet below Subgrade or finished ground elevation and backfill the hole to the satisfaction of the Engineer. Where an existing sign post is located within a sidewalk area, the Contractor shall remove the post and finish the area so as to make the sidewalk continuous. Aluminum signs, wood signs, wood sign posts, wood Structures, metal sign posts, windbeams, and other metal structural members shall become the property of the Contractor and shall be removed from the project. Salvage value of the removed signs and sign Structure members shall be reflected in the Contractor's Bid price for other items of Work.

8-21.3(5) Sign Relocation

Where shown in the Plans, the existing signs and, if so indicated, the sign Structures shall be relocated by the Contractor to the location noted. Where the existing sign Structure is mounted on concrete pedestals, the Contractor shall remove the pedestal to a minimum of 12-inches below finished grade and backfill the remaining hole with material similar to that surrounding the hole. Where the existing Structure is to be relocated, the Contractor shall provide necessary materials, labor, and hardware, and if so indicated, electrical conduit, conductors, etc., electrical services, and connections so as to erect and provide an operable unit to the satisfaction of the Engineer. All materials damaged by the Contractor shall be replaced at no cost to the Contracting Agency. Unless otherwise allowed, relocation of each existing sign and Structure shall be accomplished during the day in which it was removed. Relocation of overhead signs and Structures shall be accomplished during the hours between 12 midnight and 4:00 a.m. or as approved by the Engineer.

8-21.3(6) Sign Refacing

Where indicated in the Plans or in the Special Provisions, the Contractor shall reface existing signs with sheet aluminum overlay panels. Unless otherwise indicated in the Plans or allowed by the Engineer, all Work shall be accomplished while the existing sign is in place. Modifications to each sign shall be completed during the same day in which the Work is commenced.

Prior to the installation of overlay panels, the existing legend (message and border) shall be removed. The aluminum overlay panels shall be butt jointed. Aluminum or stainless steel screws, a minimum of ½-inch in length, shall be used to attach overlay panels to existing plywood signs. In addition to the screws, two ¼-inch diameter by 1-inch-long aluminum or stainless steel bolts shall be installed through the top of each panel and the plywood sign. Aluminum blind rivets shall be used to attach overlay panels to existing aluminum signs. Screws or rivets shall be installed at 24-inch centers. Unless otherwise noted, sign background material shall be in accordance with Section 9-28.

After installation of overlay panels, the existing legend shall be reinstalled or, where indicated in the Plans, new legend or portions thereof shall be furnished and installed by the Contractor. Direct applied legend shall be applied to the new face prior to resurfacing. Layout and letter spacing shall be in accordance with Contracting Agency standards unless otherwise approved by the Engineer. New legend components shall be of the same type and size as the existing materials, and it shall be the Contractor's responsibility to verify material type and size. Materials damaged by the Contractor shall be replaced at no expense to the Contracting Agency.

8-21.3(7) Sign Message Revision

Where indicated in the Plans or in the Special Provisions, the Contractor shall revise existing sign messages or layouts. The Contractor shall remove and reinstall portions of or all of the existing message or furnish and install new message components as necessary to provide the revised message as indicated. Prior to installing the revised message, the Contractor shall thoroughly clean the sign face and plug all existing rivet holes with aluminum blind rivets painted the same color as the sign background. Plugging screw holes in plywood signs will not be required. Modifications to the sign shall be completed during the same day in which Work is commenced and while the sign is in place. All new materials necessary to accomplish this Work shall be the same type and size as the existing components, and it shall be the Contractor's responsibility to verify such component type and size. Materials damaged by the Contractor shall be replaced at no expense to the Contracting Agency. Existing materials not reinstalled shall become the property of the Contractor and shall be removed from the project.

8-21.3(8) Sign Cleaning

Signs shall be cleaned after relocation or installation to the satisfaction of the Engineer. The Contractor shall not use cleaning solvents that would be harmful to the sign finish.

8-21.3(9) Sign Structures

8-21.3(9)A Fabrication of Steel Structures

Fabrication and erection shall conform to the applicable requirements of Section 6-03 and 9-06. All welded connections of sign bridge and cantilever sign Structure posts, arms, and beams, including base and connection plates, shall be cleaned prior to welding to remove all mill scale from within 2-inches of the weld. As an alternative to the blast cleaning requirements of Section 6-03.3(13), the Contractor may perform the cleaning using power hand tools as approved by the Engineer. Unless otherwise specified in the Plans or Special Provisions, metal surfaces shall not be painted.

8-21.3(9)B Vacant

8-21.3(9)C Timber Posts

Timber sign posts shall conform to the requirements of Section 9-28.14(1).

8-21.3(9)D Aluminum Structures

Welding of aluminum shall be in accordance with Section 9-28.14(3).

8-21.3(9)E Bridge Mounted Sign Brackets

The Contractor shall fabricate and install sign supports for mounting signs on bridge Structures at the locations and as shown in the Plans, including inserts and anchor bolts. Fabrication and installation shall be in accordance with applicable requirements of Sections 6-03 and 9-06. Metal surfaces shall not be painted.

The quantity of structural carbon steel shown in the Contract is listed only for the convenience of the Contractor in determining the volume of Work involved and is not guaranteed to be accurate. The prospective Bidders shall verify this quantity before

submitting a Bid. No adjustments other than for approved changes will be made in the lump sum Contract price for the bridge mounted sign brackets, even though the actual quantity of structural carbon steel required may deviate from that listed.

8-21.3(9)F Bases

Sign Structures shall not be erected on concrete foundations until foundations have attained a compressive strength of 2,400-PSI.

The excavation and backfill shall be in conformance with the requirements of Section 2-09.3(1)E.

Foundation concrete shall conform to the requirements for the specified class, be cast-in-place concrete and be constructed in accordance with Section 6-02.2 and 6-02.3. Concrete for roadside sign Structure post shall be Class 3000, concrete for sign bridge and cantilever sign Structure foundations shall be Class 4000, except as otherwise specified. Where water is present in the shaft excavations for Type 1 foundations for sign bridges and cantilever sign Structures, the shaft concrete shall be Class 4000P placed in accordance with Section 6-02.3(6)B.

Spiral steel reinforcing bars for roadside sign Structures post shall conform to AASHTO M32. All other steel reinforcing bars for sign Structure foundations shall conform to Section 9-07.

The bottom of concrete foundations shall rest on firm ground. If the portion of the foundation beneath the existing ground line is formed or cased instead of being cast against the existing soil forming the sides of the excavation, then all gaps between the existing soil and the completed foundation shall be backfilled and compacted in accordance with Section 2-09.3(1)E.

Foundations shall be cast in 1 operation where practicable. The exposed portions shall be formed to present a neat appearance.

The foundations shown in the Plans shall be extended if conditions require additional depth, and such additional Work, if ordered by the Engineer, will be paid for as extra Work as provided in Section 1-04.4.

Forms shall be true to line and grade. Tops of foundations for roadside sign Structures shall be finished to ground line, unless otherwise shown in the Plans or directed by the Engineer. Tops of foundations for sign bridges and cantilever sign Structures shall be finished to the elevation shown in the Plans.

Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be plumbed and rigidly placed in proper position and to proper height prior to placing concrete and shall be held in place by means of a template until the forms are removed.

All bolts and anchor bolts shall be installed so that 2 full threads extend beyond the top of the top heavy-hex nut. Anchor bolts shall be installed plumb, plus or minus 1-degree.

Plumbing of sign bridges and cantilever sign Structures shall be accomplished by adjusting leveling nuts. Shims or other similar devices for plumbing or raking will not be permitted.

Slip base and hinge connection nuts of roadside sign Structures shall be tightened using a torque wrench to the torque, and following the procedure, specified in the Standard Plans.

The top heavy-hex nuts of sign bridges and cantilever sign Structures shall be tightened in accordance with Section 6-03.3(33), and by the Turn-Of-Nut Tightening Method to a minimum rotation of ¼-turn and a maximum rotation of ⅓-turn past snug tight. Permanent marks shall be set on the base plate and nuts to indicate nut rotation past snug tight.

Both forms and ground which will be in contact with the concrete shall be thoroughly moistened before placing concrete; however, excess water in the foundation excavation will not be permitted. Forms shall not be removed until the concrete has set at least 3-days. All forms shall be removed, except when the Plans or Special Provisions specifically allow or require the forms or casing to remain.

Class 2 surface finish shall be applied to exposed surfaces of concrete in accordance with the requirements of Section 6-02.3(14)B.

Where obstructions prevent construction of planned foundations, the Contractor shall construct an effective foundation satisfactory to the Engineer.

8-21.3(9)G Identification Plates

When sign Structures are constructed, the Contractor shall attach sign Structure identification plates to the sign Structures. The identification plates will be supplied by the Engineer. When sign Structures are removed, the Contractor shall remove the sign Structure identification plates from the sign Structures and give them to the Engineer.

8-21.3(10) Vacant

8-21.3(11) Multiple Panel Signs

After installation of multiple panel signs, the Contractor shall furnish and install an approved reinforced aluminized tape on the reverse side of the sign to prevent visible light through the seam. The tape shall be pressure sensitive and a minimum of 2-inches wide and 2 mils thick. In lieu of tape, the Contractor may use 1-inch-wide aluminum sheeting riveted to the sign back. The aluminum shall be a minimum of 0.032-inch thick. Rivet heads shall match the sign face color.

8-21.3(12) Steel Sign Posts

Steel sign posts shall be connected to concrete bases using the following procedure:

1. Remove all galvanized runs and beads from washer area.
2. Assemble sign post to stub post with bolts, using 1 flat washer on each bolt between plates.
3. Shim as required to plumb sign posts.
4. Tighten bolts in a systematic order to required torque while not over tightening.
5. Loosen each bolt and retighten to required torque in the same order as initial tightening.
6. After Contracting Agency inspection of bolt torque, burr threads with center punch to prevent loosening.

8-21.4 Measurement

When shown as lump sum in the Plans or in the Proposal as permanent signing, sign bridge No. ____, cantilever sign Structure No. ____ or bridge mounted sign bracket No. ____, no specific unit of measurement will apply, but measurement will be for the sum total of all items to be furnished and installed.

Sign covering will be measured in square feet of the area of the sign covered.

8-21.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Permanent Signing", lump sum.

"Sign Bridge No. ____", lump sum.

"Cantilever Sign Structure No. ____", lump sum.

"Bridge Mounted Sign Bracket No. ____", lump sum.

"Sign Covering", per square foot.